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Title: Living and Dying after the End: Is there a higher Mortality Risk after Bereavement in Argentinian Pensioners?

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Abstract:

This study describes differential mortality for the 2015-2018 period in Argentina between pensioners who lost their partner (those who were bereaved) and those who did not. To do so, we used social security pension records. Since pension coverage in ages above 65 is universal in Argentina (and consists in both a monetary benefit plus a health care plan), almost everyone is included in such records for that matter (more than 14 million person-years). We estimated differentials between a group of pensioners who lost and two groups who did not. Such estimations indicate that survivorship pensions beneficiaries (people who lost their partner), have a standardized mortality ratio 1,2 times higher for males and 1,18 for females than ordinary pension beneficiaries, and slightly higher than non-contributory pensioners as well for both sexes.

Being a beneficiary of a survivorship pension indicates that a person has lost their partner. However, it is true that this may implicate other situations: that they may found another partner after bereavement and they still get paid their pension, or that the couple was separated before one of the individuals passed away (but not in a legally binding way). This means that those differences could (or could not) actually be larger, because such factors may give some 'bereavement bias'. Further analysis should include differentials by pension income, other aspects of socioeconomic status and duration of the benefit, in order to establish a more precise role of bereavement in differential mortality in Argentina.

Extended abstract:

Introduction and objectives:

This study is mainly descriptive: we intend to give an approximation of the differential mortality between adults aged and above in Argentina (in the 2015-18 period), using the “type of pension benefit” as an indicator of bereavement.

To do so, we take advantage of administrative individual pension records, provided by Argentina’s National Administration of Social Security (ANSES).

There are three main types of benefit in Argentina’s pension system: Ordinary retirement Pension Benefits (OPB), which are given when minimum retirement age and time of contribution requirements are met, valued depending on the working income and years of contribution among other factors: Non-Contributory Pensions (NCP), a minimum-valued pension benefit given to those who couldn’t met the years of contribution requirement (and most of the time this implicates some social disadvantages during the life course); and Survivorship Pension Benefits (SPB), 70 per cent of the deceased person wage/pension benefit is given to her/his widow/widower. Since pension coverage of some type in Argentina is virtually universal in adults aged 65 or above (Bramajo, 2019; Grushka, Gaiada & Calabria, 2017), basically every person perceives at least one benefit of some kind.

We expect that the “type of pension benefit” can adequately proxy the event of bereavement, under the assumption that those who lost their partner (and perceive a survivorship pension because of that) have a greater mortality (Helsing, Szklo and Comstock, 1981; Stroebe, 1994). Essentially, we expect that having a SPB is a decent approximation (with the correspondent advantages and disadvantages) to analyze the role of bereavement in pensioner mortality.

This approach has some advantages and disadvantages: the main advantage is that since pension coverage is almost 100 per cent and since we rely on administrative records that are updating constantly, so we can make analysis with a strong exposure (more than 14 million person-years, going from the 1st of July of 2015 to 30th of June of 2018). Those records also provide some basic sociodemographic characteristics at an individual level (including the date of death of the beneficiaries) with very little to almost none-omission. And the fact that practically everyone who is a beneficiary of a SPB actually lost their partner (96% of the widows/widowers aged 65 and above

receives an SPB benefit, according to the last Argentinian National Survey of Social Security¹)

The main disadvantages for estimating the impact of bereavement in mortality based on pension records rely on the fact that several events can happen in a lifetime after bereavement and are not registered in the pension records: maybe the widow/widower found a new partner and hasn't renounced to the SPB because it's a permanent benefit, maybe the couple wasn't married and didn't leave any benefit to their partner, maybe the couple got married just to give the SPB "as a gift" to somebody before parting as an appreciation gesture (a practice while very rare, exists) to the receiver (from such a practice it's understated that there is no "*romantic/emotional*" link between the individuals). Moreover, the records cannot estimate the family or housing situation of the beneficiaries. It is hard to make an estimation of the potential impact of such events in OPB/SP mortality, due to the lack of complementary data sources, especially considering that there are no previous studies in Argentina that deal with the topic. However, by experience, we can assume that the sum of this confounding factors suggest that any potential bias between groups is more likely to compensate or even concentrate in the OPB group (that is, people who lost their partner but do not receive an SPB). Because of this, the main objective of this study is not to find an absolute estimation of mortality, but to establish differentials between the groups.

We stated beforehand that there are no previous studies that explore such a topic in Argentina at any level. However, in Latin America, we can mention the effort of Rosero Bixby, Brenes and Collado (2002), who established in a report that SPB mortality is higher in comparison to other beneficiaries in Costa Rica. In Brazil, a study based in a semi-panel survey in São Paulo Metropolitan Area between 2000 and 2006. arrives to a similar conclusion: people who lost their partner have a higher mortality risk (Gomes et al., 2013).

Data and Methods:

We analyze three annual registers for Social Security data. The annual register refers to a single date (1 of July of each year) and presents some basic demographic data of each pensioner reported as alive in that date. By matching with the CUILs (Identification Number) with a separate mortality data file (provided by ANSES as

¹ In Spanish, Encuesta Nacional de Protección y Seguridad Social (ENAPROSS), taken in 2015 by the (former) Ministry of Labour, Employment and Social Security of Argentina.

well), we can establish which pensioners who were alive at the 1st of July passed away in a subsequent 365 day period.

In Argentina, individuals can enjoy more than one pension benefit. For instance, a person can earn a SP but also a NCB because it has fulfilled the age requirements but lack the contribution years to enjoy an OPB). For such a purpose, everyone who enjoys a SPB is considered a widow/widower for the definitions of this study, independently if it's their "main" (in monetary terms) pension benefit or not. In the case they have more than one benefit, we will sum them to establish their total amount. This means that while it's true that SPBs have a nominally lower amount than OPBs, SPBs beneficiaries (that can have more than one benefit) have an average higher pension income than OPBs beneficiaries (which are restricted to only an OPB for the purposes of this work), at least at an individual (not household) level. For the purposes of this study, then, we consider the following three groups: individuals who enjoy a SPB (and may or may not enjoy some other benefit), individuals who receive a OPB exclusively and individuals who receive a NCB. For the time being, we make the assumption that there are no changes in state during the period among the groups.

The main measure for this study is standardized death rates for population aged between 65 and 99 years. Due to some consistency problems with centenarians, we decided to exclude them of the study for the time being. Since each group has different age and sex compositions (as shown in Table 1), direct standardized rates seem a basic but appropriate measure for estimating differentials. The standardization procedure is the same as described in Naing (1999). We consider the total amount of person-years of the whole period in the register, by 5-year age groups, as the standard structure. We decided to present an relative pension income measure as well to check, at least by approximation, any income effects. Argentina in the last decades has gone into a continuous process of both inflation and depreciation of its currency (Argentine Peso). The simplest way to standardize such fluctuations and differences we consider them as a ratio compared to the other groups (being the OPB group the reference group). Table 1 reveals that the SPB group is older and has a higher concentration of females (highly related to the ageing process), but also has the same per capita income compared to the OPB beneficiaries. The NCP group, in average, has a bit more than half of the pension income of the other two groups (mainly due to the non-contributory nature of the benefit).

Table 1: General characteristics about pension beneficiaries in Argentina, July 2015- June 2018

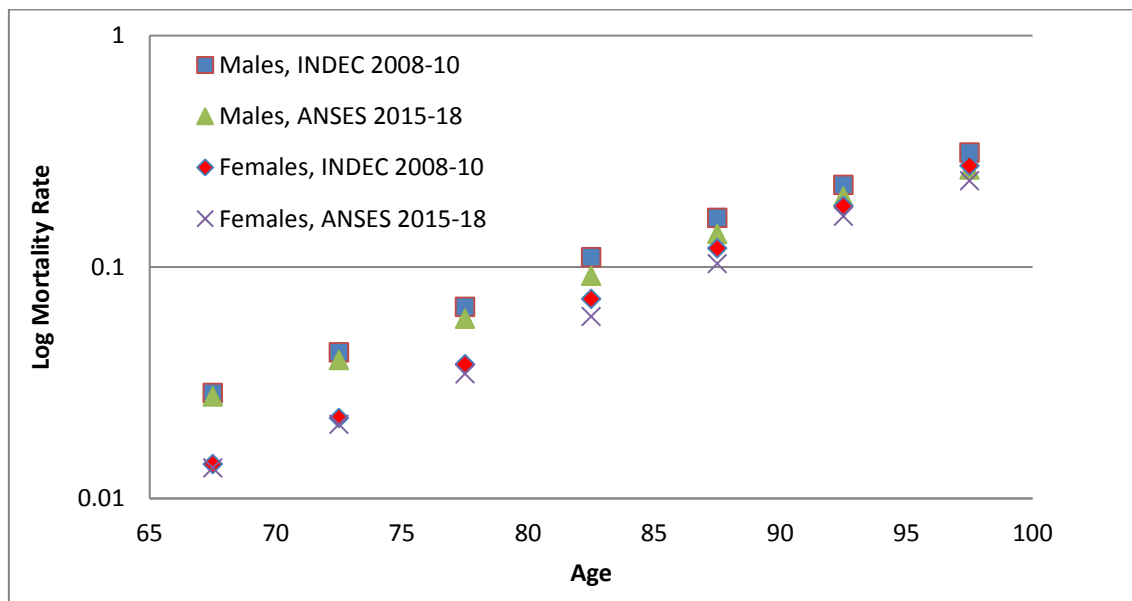
<u>Benefit</u>	<u>Person Years Exposure</u>	<u>% of Females</u>	<u>Average Age</u>	<u>Pension Income Ratio</u>
OPB	4624694	37.2	75.2	1.00
NCP	6055698	61.7	72.4	0.56
SPB	3611785	87.9	78.6	1.00
Total	14292178	60.5	75.3	0.76

Source: own elaboration based on ANSES data.

Pension records reported 689.565 deaths (almost 5% of the total pensioner population) in the 3 year period that was analyzed.

It has to be mentioned that pension records are not specifically designed to analyze mortality trends. However Bramajo (2019) has shown that for population aged 65 and above, both mortality data and population size of pension registers and population projections (last Census was in 2010 and the following is scheduled for 2020, so we relied on projections to check the data quality) are almost identical. The last published life tables for Argentina, published by the National Census Bureau, the INDEC (for the period 2008-2010) had some similar mortality patterns (expressed in the central mortality rate or ${}_5m_x$) to ANSES data as well, as shown in Figure 1. Since there is some time difference between both measures, we are interested in only checking consistency in the pattern, and we are not looking for an exact match. That being said, because population of adults aged 65 and above has some distinctive stability and has very slight variations on its structure, and mortality improvements over time were very modest, differences between the measures are slight.

Figure 1: Log mortality rates by sex and five year groups according to ANSES and INDEC sources. Argentina.



Source: own elaboration based on ANSES and INDEC (2013)

Preliminary Results:

As a first measure, we estimate mortality rates by large age groups. The results shown in Table 2 reveal that potentially serious age and composition effects do exist, which emphasizes the need for standardization. This becomes evident in the fact that the NCP group, which is the group with the worst assumed living conditions, has the lowest mortality. This is due to their younger age structure. By contrast, SPB mortality results may be influenced by their more aging structure.

Table 2. Mortality Rates (x 1000) for selected age groups by sex and type of benefit in adults aged between 65 and 00 years. Argentina, 2015-2018

Sex	Age Group	Type of Benefit			
		OPB	NCP	SPB	Total
Males	65-79	36.6	40.5	51.9	39.3
	80-99	114.4	114.9	135.3	117.9
	Total	57.8	47.7	90.3	56.2
Females	65-79	18.3	20.9	25.9	21.7
	80-99	86.7	86.8	101.9	95.5
	Total	38.3	30.4	60.6	43.1

Source: own elaboration based on ANSES.

After the standardization it becomes more clear than the SPB beneficiaries have a higher risk compared to the other two groups, particularly with OPB beneficiaries. It must be mentioned as well that while in relative terms the differences are similar, in males mortality differentials are wider. So a 1.20/1.18 ratio between the SPB and OPB reflects in a mortality risk almost 14 points higher for SPB males and almost 7.5 SPB for females.

Table 3. Standardized Mortality Rates (x 1000) and Ratios by sex and type of benefit in adults aged between 65 and 99. Argentina, 2015-2018

Sex	SMR * 1000					
	OPB	NCP	SPB	Total	Ratio SPB/OPB	Ratio SPB/NCP
Males	68.8	77.3	82.4	73.3	1.20	1.07
Females	42.2	48.2	49.6	47.5	1.18	1.03

Source: own elaboration based on ANSES.

However, we cannot assume yet that this differentials in mortality are due to bereavement. We established that pension income was similar, in average, for the OPB and the SPB groups (and higher from SPB beneficiaries than NCP beneficiaries). However, further analysis should consider income at an individual level instead of an average, and maybe consider other effects such as regional conditions of life. Also, possible duration effects may take part as well. As Thierry (2000) suggests, shorter bereavement time may be related with higher mortality risks. We can conclude so far that SPB beneficiaries have a higher mortality risk than the other groups. How much of this mortality is explained by bereavement has yet to be estimated, considering the limitations that the pension records provide.

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